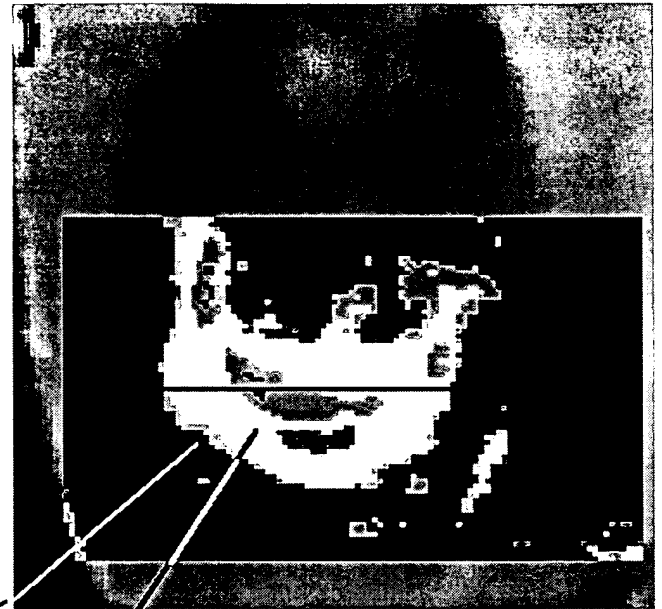


A

72

Raw video



71

Yawn resolution

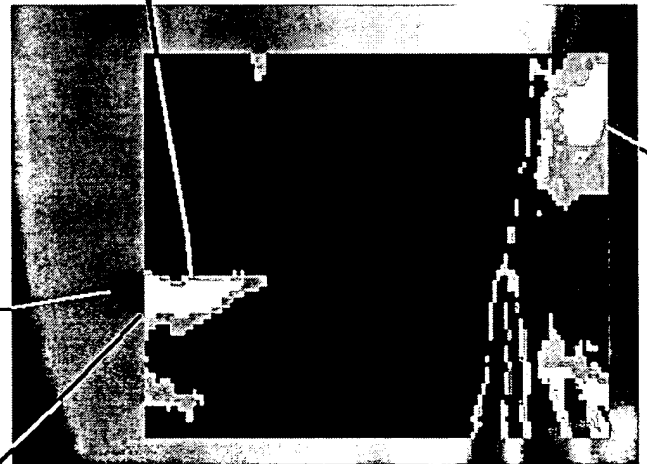
B

Closed mouth resolution



C

73



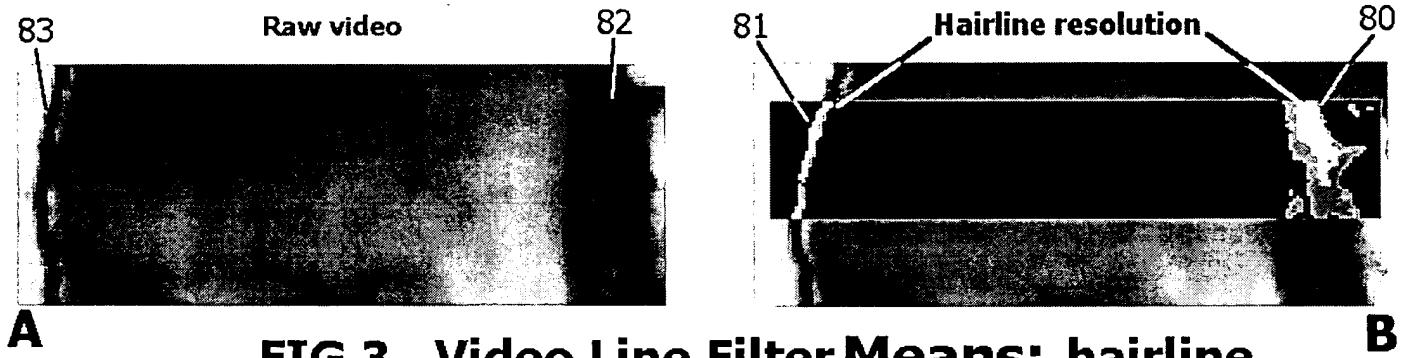
75

74

76

FIG 2. Video Line Filter Means: mouth

D



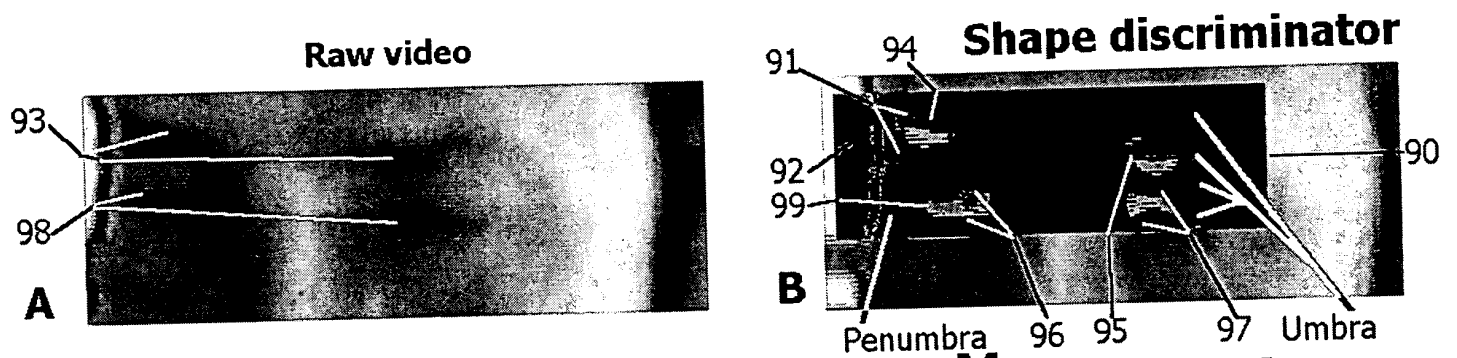


FIG 4. Shape Discrimination Means: eyes

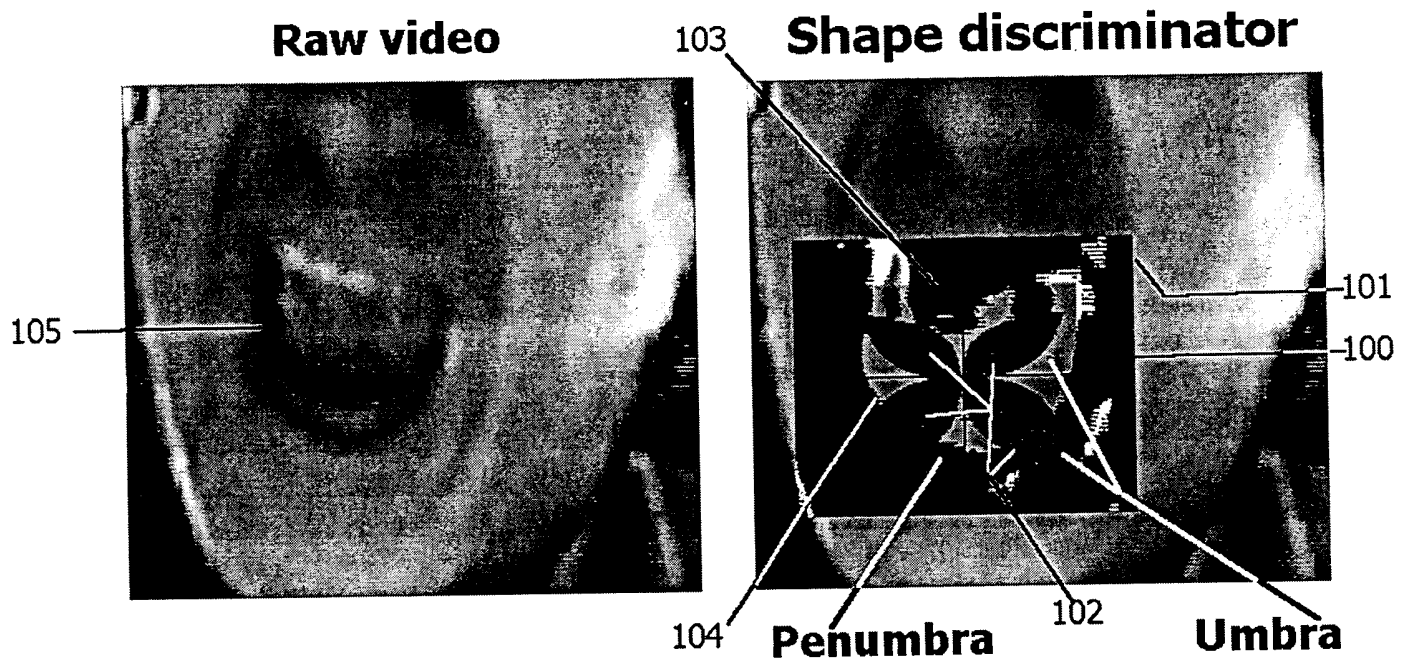


FIG 5. Shape Discrimination Means: mouth

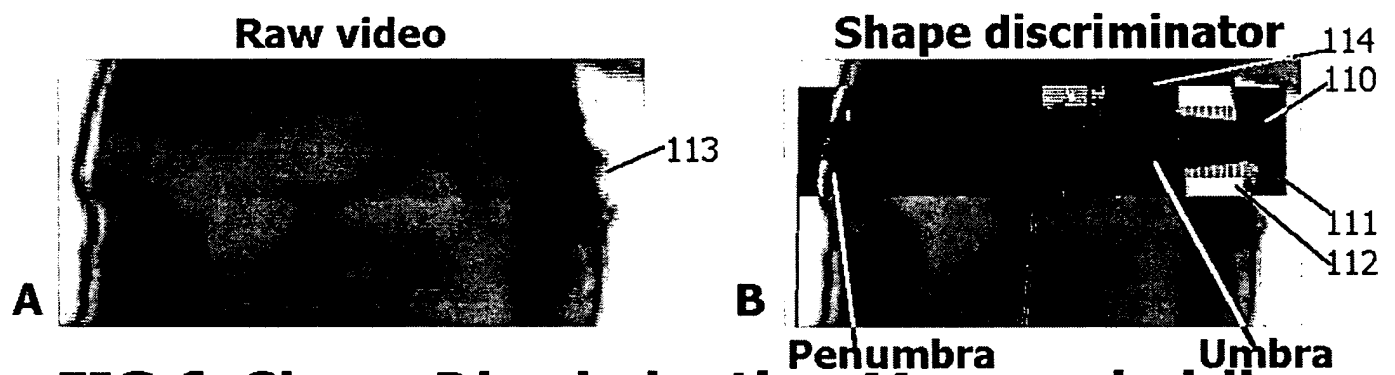


FIG 6. Shape Discrimination Means: hairline

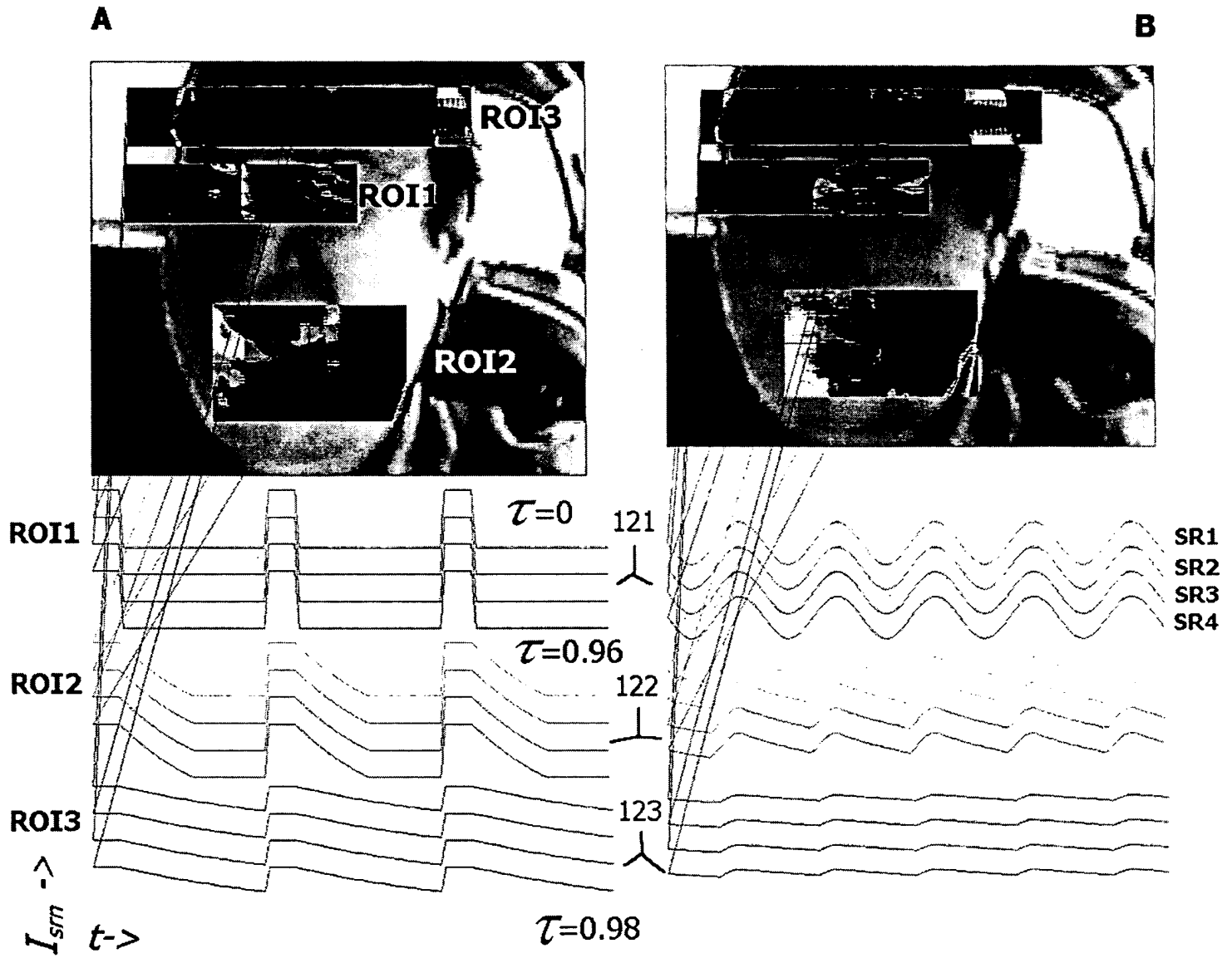


FIG 7. Time-Intensity Transform Means: Transient and Sine Response

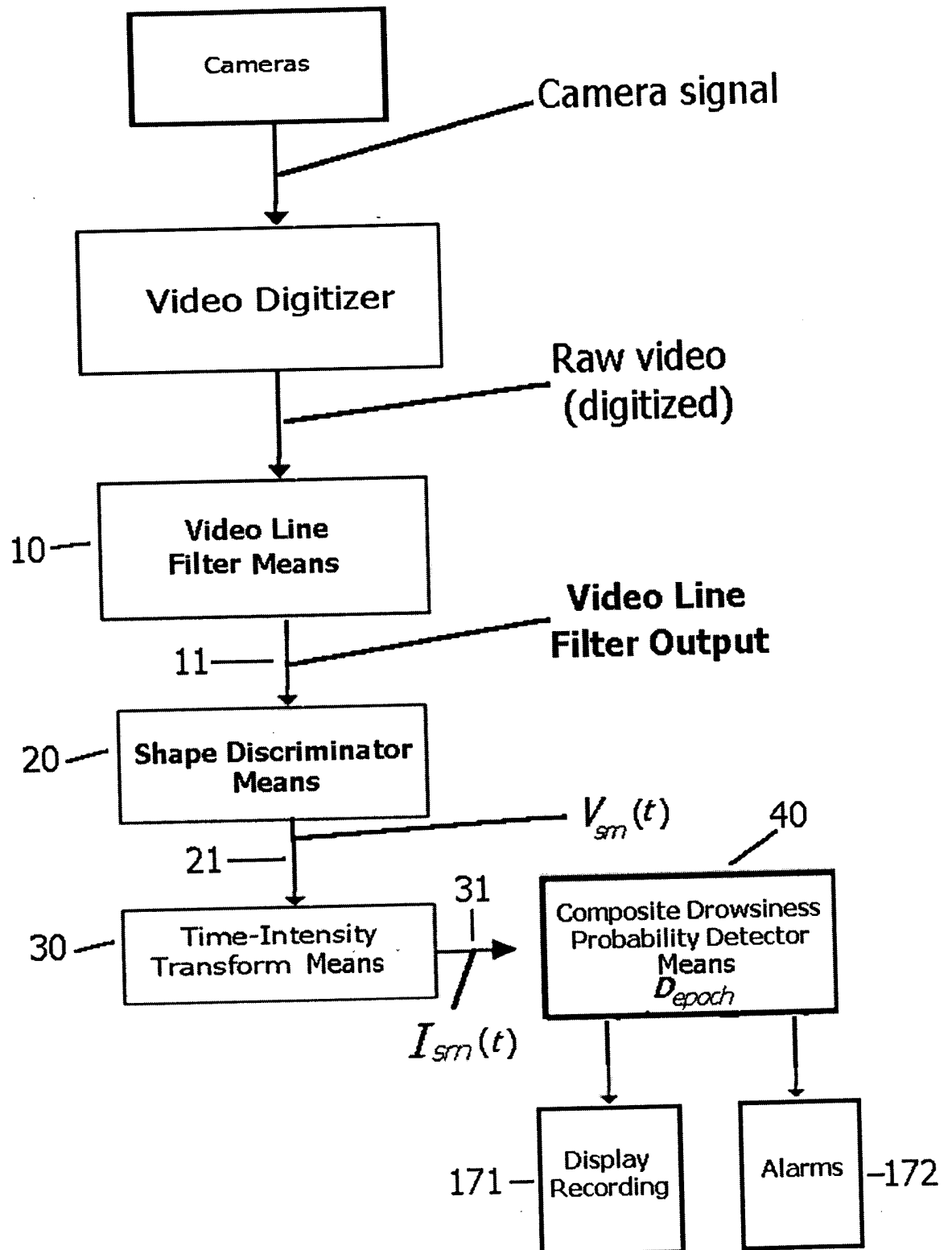


FIG 8. Signal Flow

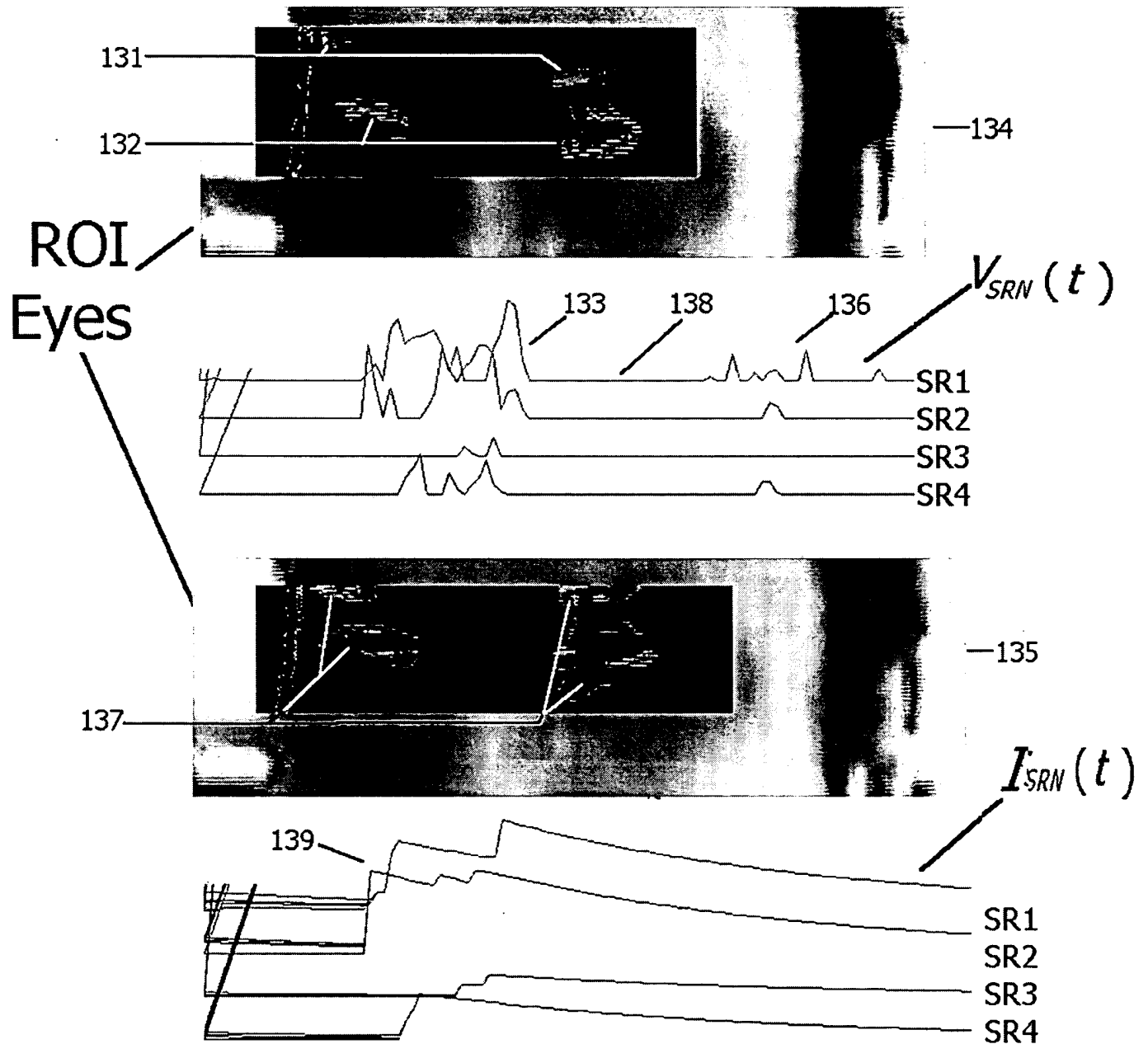


FIG. 9. SDM and TITM Outputs for Eye ROI

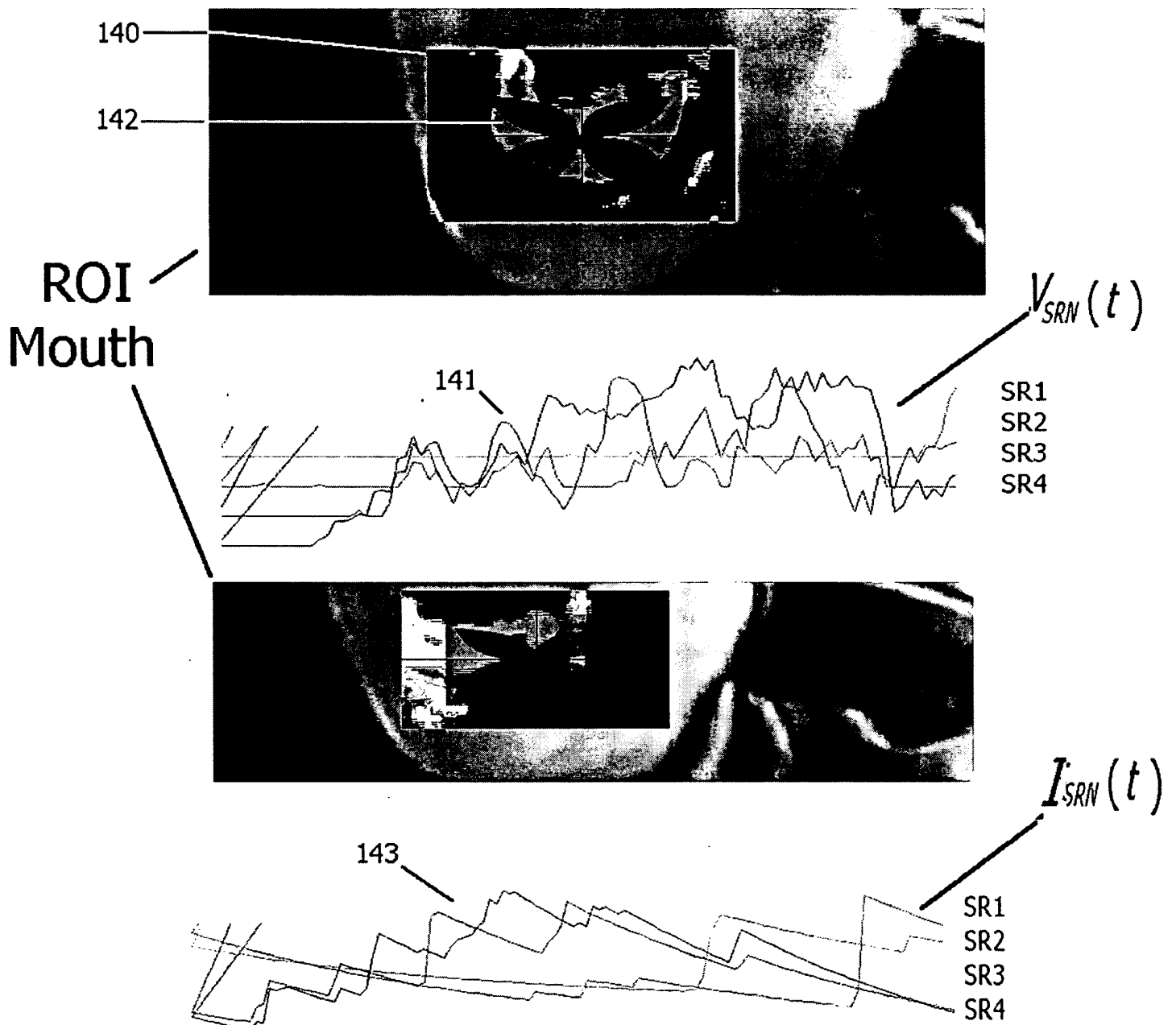


FIG.10. SDM and TITM Outputs for Mouth ROI

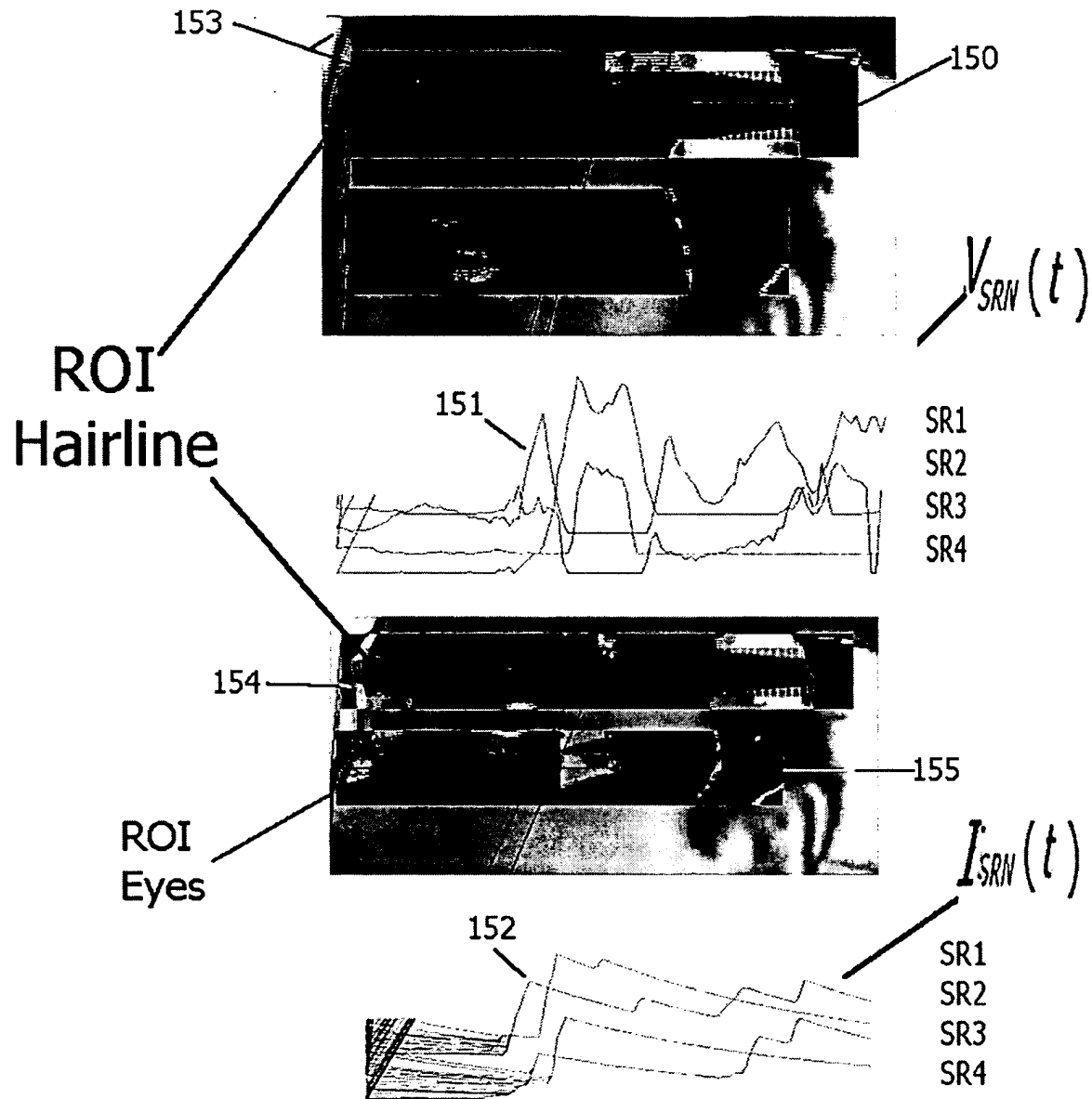


FIG. 11. SDM and TITM Outputs for Hairline ROI

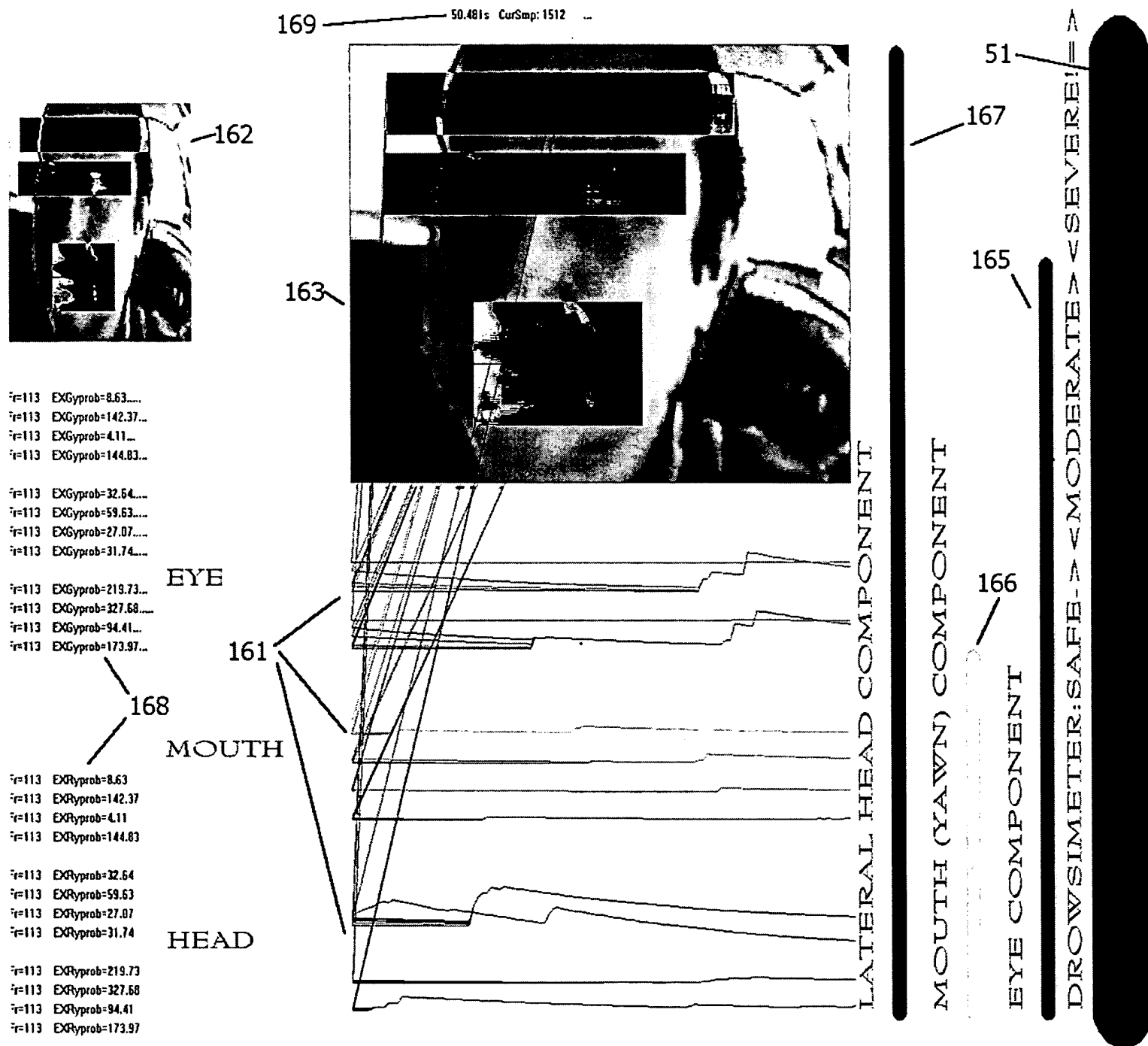


FIG. 12. System Display Including Drowsiness Components and Composite Indicator